



AP3 Rec'd PCT/PTO 31 MAY 2006

PCT #7

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Yuko KURIMOTO et al.

Application No.: 10/525,032

Filed: February 17, 2005

For: RUST INHIBITOR

**ATTENTION:
OFFICE OF PCT LEGAL
ADMINISTRATION**

Attorney-Advisor: A. SMITH

Docket No.: 122778

RENEWED PETITION UNDER 34 C.F.R. §1.47(a)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 CFR §1.47(a), this renewed Petition is filed to request examination of the above-identified patent application. The renewed Petition is based on a telephone interview conducted with Attorney-Advisor Smith on April 17, 2006.

Attached hereto is a revised Declaration of Messrs. Yasuo Nishino, Jun-ichiro Goto, Akihiro Kobayashi, and Daichi Kitaori supporting the Petition under 37 CFR §1.47(a) that includes the facts summarized herein below pertinent to a filing under Rule 47(a). In particular, as discussed during the telephone interview, the revised Declaration now asserts that an entire copy of the Application¹, including the specification, claims, abstract, and Declaration were mailed to Mr. Kazuo Kobayashi at his last known address. Accordingly, as agreed during the April 17, 2006 telephone interview, the renewed Petition should be granted.

Also attached is a Declaration/Power of Attorney duly executed by Mr. Yuko Kurimoto, one of the two co-inventors of the claimed invention. The other co-inventor, Mr. Kobayashi, has refused to execute the application. Accordingly, this Declaration has also been signed on behalf

¹ The application does not include any drawings. Thus, no drawings were forwarded to Mr. Kobayashi.

of Mr. Kazuo Kobayashi by Mr. Yuko Kurimoto as his co-inventor in accordance with 37 CFR §1.64 (see MPEP §409.03(a)).

The last known mailing address of the non-signatory co-inventor is: Mr. Kazuo Kobayashi, 2-8-106 Sotojima-cho, Moriguchi-shi, Osaka 570-0096, Japan.

As set forth in the attached Declaration of Messrs. Yasuo Nishino, Jun-ichiro Goto, Akihiro Kobayashi, and Daichi Kitaori, repeated attempts have been made to have Mr. Kazuo Kobayashi cooperate in the preparation and execution of the application.

Thus, a diligent effort has been made to have Mr. Kazuo Kobayashi execute the complete application, but Mr. Kazuo Kobayashi has to date refused to do so. It is therefore requested that the first Declaration/Power of Attorney be placed in the application and that the application be accepted for examination.

Should Mr. Kazuo Kobayashi reconsider his position and, either himself or through a representative, indicate a willingness to file a Substitute Declaration, such will be prepared and filed promptly upon execution.

As this is a renewed petition, no additional fee is required. However, please credit any overpayment or debit any underpayment to Deposit Account No. 15-0461.

If any further information is needed in order to obtain examination of this application pursuant to 37 CFR §1.47(a) and/or 37 CFR §1.63, Applicants' undersigned representative invites the Patent Office to telephone at the number listed below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Jesse O. Collier
Registration No. 53,839

JAO:JOC/smo

Date: May 31, 2006

OLIFF & BERRIDGE
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Yuko KURIMOTO et al.

Application No.: 10/525,032

Filed: February 17, 2005

Docket No.: 122778

For: RUST INHIBITOR

DECLARATION UNDER 37 C.F.R. §1.47(a)

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

We, Yasuo Nishino, Jun-ichiro Goto, Akihiro Kobayashi, and Daichi Kitaori, hereby declare and say that:

- (1) We are attorneys of GMC CO., LTD;
- (2) We have dealt with U.S. Application Serial No. 10/525,032, filed on February 17, 2005, which is the U.S. National Stage of PCT/JP02/10220;
- (3) The entire International Application Number, PCT/JP02/10220, including specification, claims, and abstract, was published as WO2004/018732 on March 4, 2004;
- (4) The invention was completed by the inventors, Messrs. Yuko Kurimoto and Kazuo Kobayashi;
- (5) As evidenced by attached Exhibits A and B, a copy of the Declaration, already executed by Mr. Yuko Kurimoto, was mailed to Mr. Kazuo Kobayashi at his last known address and duly received by Mr. Kazuo Kobayashi on September 15, 2005;
- (6) The Declaration properly identified the application by the International Application Number, PCT/JP02/10220, and the filing date, September 30, 2002;
- (7) As evidenced by attached Exhibits C and D, a first request to execute the application was mailed to Mr. Kazuo Kobayashi at his last known address on September 12, 2005 and duly received by Mr. Kazuo Kobayashi on September 15, 2005;
- (8) Mr. Kazuo Kobayashi failed to respond to the first request;
- (9) As evidenced by attached Exhibits E and F, a second request to execute the application was mailed to Mr. Kazuo Kobayashi at his last known address on October 11, 2005 and duly received by Mr. Kazuo Kobayashi on October 19, 2005;

(10) Mr. Kazuo Kobayashi failed to respond to the second request;

(11) As evidenced by attached Exhibits G and H, a third request to execute the application including a copy of the Declaration, a copy of the International Application Number PCT/JP02/10220 (published as WO2004/018732 and including the Japanese specification and claim, and English abstract), a complete copy of the English U.S. National Stage Application Number 10/525,032 (including specification, claim, and abstract) corresponding to the International Application Number PCT/JP02/10220, and a complete copy of the Preliminary Amendment filed in U.S. National Stage Application Number 10/525,032 was mailed to Mr. Kazuo Kobayashi at his last known address on April 21, 2006 and duly received by Mr. Kazuo Kobayashi on April 22, 2006 ;

(12) Mr. Kazuo Kobayashi failed to respond to the third request;

(13) All statements made herein are true; and further that willful false statements and the like so made may be punishable by fine or imprisonment or both, under Section 1001 Title 18 of the U.S. code and that such willful false statements may jeopardize the validity of the application or any patent issuing therefrom.

Dated May 24, 2006

Dated May 24, 2006

Dated May 24, 2006

Dated May 24, 2006

Attachments:

- Exhibit A: Copy of Declaration sent to Mr. Kazuo Kobayashi
- Exhibit B: Certificate of Delivery for Declaration (w/ English translation)
- Exhibit C: First Notice (w/ English translation)
- Exhibit D: Certificate of Delivery for First Notice (w/ English translation)
- Exhibit E: Second Notice (w/ English translation)
- Exhibit F: Certificate of Delivery for Second Notice (w/ English translation)
- Exhibit G: Third Notice (w/ English translation)
- Exhibit H: Certificate of Delivery for Third Notice (w/ English translation)

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

西野泰夫

Yasuo Nishino

後藤 潤一郎

Jun-ichiro Goto

小野 昭博

Akihiro Kobayashi

北條 大志

Daichi Kitaori

Declaration and Power of Attorney For Patent Application

(C)

特許出願宣誓書及び委任状

Japanese Language Declaration

日本語宣誓書

下記の氏名の発明者として、私は以下の通り宣誓します。

As a below named inventor, I hereby declare that:

私の住所、郵便の宛先、国籍は下記の私の氏名の後に記載されたとおりです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者（下記の氏名が複数の場合）であると信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

RUST INHIBITOR

上記発明の明細書は、

- ☐ 本書に添付されています。
☐ 月 日に提出され、米国出願番号または特許協力条約国際出願番号を _____ とし、
(該当する場合) _____ に訂正されました。

the specification of which

- ☐ is attached hereto.
☒ was filed on 30/09/2002
as United States Application Number or
PCT International Application Number
PCT/JP02/10220 and was amended on
_____ (if applicable).

私は特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義される通り、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulation, Section 1.56.

Japanese Language Declaration
(日本語宣誓書)

私は、米国法典第 35 編 119 条 (a)-(d) 項又は 365 条 (b) 項に
 基き、下記の米国以外の国の少なくとも一カ国を指定している特
 許協力条約 365 (a) 項に基く国際出願、又は外国での特許出願も
 しくは発明者証の出願についての外国優先権をここに主張する
 ともに、優先権を主張している、本出願の前に出願された特許ま
 たは発明者証の外国出願を以下に、枠内をマークすることで、示
 しています。

I hereby claim foreign priority under Title 35, United States Code,
 Section 119 (a)-(d) or 365(b) of any foreign application (s) for
 patent or inventor's certificate, or Section 365(a) of any PCT
 international application which designated at least one country
 other than the United States, listed below and have also
 identified below, by checking the box, any foreign application for
 patent or inventor's certificate, or PCT International application
 having a filing date before that of the application on which
 priority is claimed.

Prior Foreign Application(s)
 外国での先行出願

Priority Claimed
 優先権主張

<u>2002-238045</u>	<u>Japan</u>
(Number)	(Country)
(番号)	(国名)
<u>PCT/JP02/10220</u>	<u>Japan</u>
(Number)	(Country)
(番号)	(国名)
<u> </u>	<u> </u>
(Number)	(Country)
(番号)	(国名)

<u>20/08/2002</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Day/Month/Year Filed)	Yes	No
(出願年月日)	はい	いいえ
<u>30/08/2002</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Day/Month/Year Filed)	Yes	No
(出願年月日)	はい	いいえ
<u> </u>	<input type="checkbox"/>	<input type="checkbox"/>
(Day/Month/Year Filed)	Yes	No
(出願年月日)	はい	いいえ

私は、下記の米国法典第 35 編 120 条に基づいて下記の米国特
 許出願に記載された権利、又は米国を指定している特許協力条
 約 365 条に基づく権利をここに主張します。また、本出願の各請
 求範囲の内容が米国法典第 35 編 112 条第 1 項又は特許協力条約
 で規定された方法で先行する米国特許出願に開示されていない
 限り、その先行米国出願書提出日以降で本出願書の日本国内ま
 たは特許協力条約国際提出日までの期間中に入手された、連邦
 規則法典第 37 編 1 条 56 項で定義された特許資格の有無に関す
 る重要な情報について開示義務があることを認識しています。

I hereby claim the benefit under Title 35, United States
 Code, Section 120 of any United States (s), or Section 365(c) of
 any PCT International application designating the United States,
 listed below and, insofar as the subject matter of each of the
 claims of this application is not disclosed in the prior United
 States or PCT International application in the manner provided by
 the first paragraph of Title 35, United States code Section 112, I
 acknowledge the duty to disclose information which is material to
 patentability as defined in Title 37, Code of Federal Regulations,
 Section 1.56 which became available between the filing date of the
 prior application and the national or PCT International filing date
 of application.

(Application No.)
 (出願番号)

(Filing Date)
 (出願日)

(Status: Patented, Pending, Abandoned)
 (現況: 特許許可済、係属中、放棄済)

(Application No.)
 (出願番号)

(Filing Date)
 (出願日)

(Status: Patented, Pending, Abandoned)
 (現況: 特許許可済、係属中、放棄済)

私は、私自身の知識に基づいて、本宣誓書で私が行う表明が
 真実であり、かつ私の入手した情報と私の信じるところに基づ
 く表明が全て真実であると信じていること、さらに故意になさ
 れた虚偽の表明及びそれと同等の行為は米国法典第 18 編第
 1001 条に基づき、罰金または拘禁、もしくはその両方によ
 り処罰されること、そしてそのような虚偽の声明を行えば、出
 願した、又は既に許可された特許の有効性が失われることを認
 識し、よってここに上記のごとく宣誓をいたします。

I hereby declare that all statements made herein of my own
 knowledge are true and that all statements made on information
 and belief are believed to be true; and further that these
 statements were made with the knowledge that willful false
 statements and the like so made are punishable by fine or
 imprisonment, or both, under Section 1001 of Title 18 of the
 United States Code and that such willful false statements may
 jeopardize the validity of the application or any patent issued
 thereon.

Japanese Language Declaration
(日本語宣誓書)

委任状：私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。
(弁理士、または代理人の氏名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)

James A. Oliff, Reg. No 27075

書類送付先

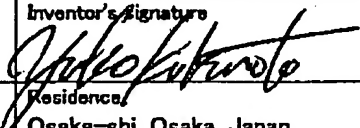
Send Correspondence to:

Oliff & Berridge, PLC
277 South Washington Street, Suite 500
Alexandria, Virginia 22314

直接電話連絡先：(名前及び電話番号)

Direct Telephone Calls to: (name and telephone number)

(703) 836-6400

唯一または第一発明者名	Full name of sole or first inventor Yuko KURIMOTO
発明者の署名 日付	Inventor's signature Date  March 20, 2005
住所	Residence Osaka-shi, Osaka, Japan
国籍	Citizenship Japan
郵便の宛先	Post Office Address 10-11-110, Higashimikuni 2-chome, Yodogawa-ku, Osaka-shi, Osaka 532-0002 Japan

第二共同発明者名	Full name of second joint inventor, if any Kazuo KOBAYASHI
第二共同発明者の署名 日付	Second Inventor's signature Date
住所	Residence Moriguchi-shi, Osaka, Japan
国籍	Citizenship Japan
郵便の宛先	Post Office Address 2-8-106, Sotajima-cho, Moriguchi-shi, Osaka 570-0096 Japan

(第三以降の共同発明者についても同様に記載し、署名すること)

(Supply similar information and signature for third and subsequent joint inventors.)

契印 8-1

郵便物配達証明書

受取人の氏名	小林 和夫 様
引受番号	155-02-81688-4 号
上記の郵便物は、17年9月15日 配達したのでこれを証明します。	
570-8799 大阪 守口	都府県郵便局 9.15 9-12

〒07370 (16・TAI)

再生紙使用

郵便はがき

46020001

名古屋中央法律事務所
弁護士 西野 泰夫 様

名古屋市中区三の丸 1-14-7

守口 郵便局

5708799

通信事務

Post Card

Zip Code 460-0001

Nagoya Chuo Horitsu Jimusho

1-14-7 Sannomaru Naka-ku Nagoya-shi

Mr. Yasuo NISHINO, Attorney

Moriguchi Post Office Zip Code 570-8799

8-12

CERTIFIED MAIL

Recipient: Mr. Kazuo KOBAYASHI

Number: 155-02 81686-4

We certify that the above-mentioned mail was delivered on September 15, 2005.

570-8799

Osaka Moriguchi Post Office

September 15, 2005

(A)

催 告 書

前 略、当 職 は 株 式 会 社 G M C か ら 依 頼 を 受
け た 代 理 人 と し て、貴 殿 に 対 し、次 の と お り
催 告 し ま す。

記

- 1 貴 殿 と 栗 本 有 康 が 発 明 者 と し て 記 載 さ れ
、 2 0 0 2 年 9 月 3 0 日 に 出 願 さ れ た 特 許
協 力 条 約 に 基 づ く 国 際 出 願 P C T / J P 2
0 0 2 / 0 1 0 2 2 0 (以 下 「 本 件 国 際 出
願 」 と 言 う 。) は、2 0 0 5 年 2 月 1 7 日
に 米 国 へ の 移 行 手 続 が 行 わ れ て お り ま す。
- 2 そ の 移 行 手 続 の 一 環 と し て 貴 殿 に は 宣 誓
書 及 び 委 任 状 並 び に 譲 渡 証 (以 下 「 米 国 手
続 用 宣 誓 書 等 」 と 言 う 。) に 署 名 す る こ と
が 求 め ら れ て お り ま す。
- 3 本 件 国 際 出 願 に 発 明 者 と し て 記 載 さ れ て
い る 以 上、こ の こ と は 貴 殿 の 権 利 で あ り か
つ 義 務 で も あ り ま す。
- 4 つ き ま し て は、米 国 手 続 用 宣 誓 書 等 を 別
便 に て、郵 送 い た し ま す の で、該 当 箇 所 に
貴 殿 自 ら が 署 名 し た う え で、当 該 用 紙 を 当
職 ま で 速 や か に ご 返 送 く だ さ る よ う お 願 い

申しあ ます。

平成 1 7 年 9 月 1 2 日

名古屋市中区三の丸一丁目14番7号

名古屋中央法律事務所

T E L 0 5 2 - 2 0 3 - 0 5 5 0

F A X 0 5 2 - 2 0 3 - 0 5 5 4

株式会社 G M C 代理人

弁護士 西 野 泰

同 後 藤 潤 一

同 小 林 明

同 北 折 大

大阪府守口市外島町2-8-106

小林 和 夫 殿

この郵便物は、平成 17 年 9 月 12 日第81686号
書留内容証明郵便物として差し出したことを証明します
名古屋中央郵便局長



Notification

We represent Kabushiki Kaisha GMC. As its attorneys, we notify you of the following.

Information

1. International application PCT/JP2002/010220 (hereafter referred to as "international application of this case"), filed on September 30, 2002 based on the Patent Cooperation Treaty, and in which you and Yuko Kurimoto are listed as inventors, entered the U.S. National Stage on February 17, 2005.
2. As part of the U.S. National Stage, you have been asked to sign a Declaration, a Power of Attorney, and an Assignment (hereafter referred to as "Declaration etc. for the U.S. National Stage").
3. As long as you are listed as one of the inventors in the international application of this case, this is your right and your duty.
4. We are separately mailing you a Declaration etc. for the U.S. National Stage. Please sign the documents and promptly return them to us.

September 12, 2005

Nagoya Chuo Horitsu Jimusho

1-14-7 Sannomaru Naka-ku Nagoya-shi

TEL (052) 203-0550

FAX (052) 203-0554

Attorneys for Kabushiki Kaisha GMC

Yasuo NISHINO, Attorney

Jyunichiro GOTO, Attorney

Akihiro KOBAYASHI, Attorney

Daichi KITAORI, Attorney

To Mr. Kazuo KOBAYASHI

2-8-106 Sotojima-cho Moriguchi-shi Osaka-fu

We certify that this document was mailed as verified content certified mail no. 81686 on
September 12, 2005. Nagoya Chuo Post Office

2006.9.15
9-12 印

郵便物配達証明書

受取人の 氏 名	小林和夫 様
引受番号	155-02-81686-2号
上記の郵便物は、17年9月15日 配達したのでこれを証明します。	
570-8799 大 阪 都 府 県 郵便局 守 口	

再生紙使用

207370 (16-TAI)

郵便はがき

4600001

名古屋市中区三の丸二丁目
十四番七号 本丸ビル四階
名古屋中央法律事務所

株式会社GMC代理人

奥西野泰天
後藤潤一郎
小枝明地
北折大

様

守口郵便局

通信事務

□□□□□□

Post Card

Zip Code 460-0001

Nagoya Chuo Horitsu Jimusho

1-14-7 Sannomaru Naka-ku Nagoya-shi Honmaru Bldg. 4th Floor

Attorneys for Kabushiki Kaisha GMC

Mr. Yasuo NISHINO, Attorney

Mr. Jyunichiro GOTO, Attorney

Mr. Akihiro KOBAYASHI, Attorney

Mr. Daichi KITAORI, Attorney

Moriguchi Post Office

September 15, 2005 8-12

CERTIFIED MAIL

Recipient: Mr. Kazuo KOBAYASHI

Number: 155-02-81686-2

We certify that the above-mentioned mail was delivered on September 15, 2005.

570-8799

Osaka Moriguchi Post Office

September 15, 2005 8-12

催 告 書

前略、当職は株式会社 G M C から依頼を受けた代理人として、貴殿に対し、平成 17 年 9 月 12 日付け内容証明郵便により、催告をいたしました。今日まで米国手続用宣誓書等必要書類をご返送いただけませんので、再度下記の通り催告します。

記

- 1 貴殿と栗本有康が発明者として記載され、2002年9月30日に出願された特許協力条約に基づく国際出願 P C T / J P 2 0 0 2 / 0 1 0 2 2 0 (以下「本件国際出願」と言う。)は、2005年2月17日に米国への移行手続が行われております。
- 2 その移行手続の一環として貴殿には宣誓書及び委任状並びに譲渡証(以下「米国手続用宣誓書等」と言う。)に署名することが求められております。
- 3 本件国際出願に発明者として記載されている以上、このことは貴殿の権利でありかつ義務でもあります。
- 4 つきましては、先日ご送付しました米国

手続用宣誓書等の該当箇所に貴殿自らが署名したうえで、当該用紙を当職まで速やかにご返送くださるようお願い申し上げます。

平成 17 年 10 月 11 日

名古屋市中区三の丸一丁目14番7号

名古屋中央法律事務所

T E L 0 5 2 - 2 0 3 - 0 5 5 0

F A X 0 5 2 - 2 0 3 - 0 5 5 4

株式会社 G M C 代理人

弁護士 西 野 泰

同 後 藤 潤 一

同 小 林 明

同 北 折 大

大阪府守口市外島町2-8-106

小林 和 夫 殿

この郵便物は、平成 17 年 10 月 11 日第 83318 号
書留内容証明郵便物として差し出したことを証明します。
名古屋中央郵便局 印

Notification

We represent Kabushiki Kaisha GMC. As its attorneys, we notified you of the following by September 12, 2005 verified content certified mail. However, as of today, we have not received the documents from you, so we again notify you of the following.

Information

1. International application PCT/JP2002/010220 (hereafter referred to as "international application of this case"), filed on September 30, 2002 based on the Patent Cooperation Treaty, and in which you and Yuko Kurimoto are listed as inventors, entered the U.S. National Stage on February 17, 2005.
2. As part of the U.S. National Stage, you have been asked to sign a Declaration, a Power of Attorney, and an Assignment (hereafter referred to as "Declaration etc. for the U.S. National Stage").
3. As long as you are listed as one of the inventors in the international application of this case, this is your right and your duty.
4. We are separately mailing you a Declaration etc. for the U.S. National Stage. Please sign the documents and promptly return them to us.

October 11, 2005

Nagoya Chuo Horitsu Jimusho

1-14-7 Sannomaru Naka-ku Nagoya-shi

TEL (052) 203-0550

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Attorneys for Kabushiki Kaisha GMC

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Daichi KITAORI, Attorney

To Mr. Kazuo KOBAYASHI

2-8-106 Sotojima-cho Moriguchi-shi Osaka-fu

We certify that this document was mailed as verified content certified mail no. 83318 on
October 11, 2005. Nagoya Chuo Post Office

契 8-12 印

郵便物配達証明書

受取人の 氏 名	小林 知夫 様
引 受 番 号	155-02-83318-3 号
上記の郵便物は、17年10月19日 配達したのでこれを証明します。	
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名古屋中央法律事務所 様

株式会社GAC代理人

〒460-0001 名古屋市中区三の丸一ー一四一七
本丸ビル四階
株式会社GAC代理人
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通信事務

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Moriguchi Post Office

8-12

CERTIFIED MAIL

Recipient: Mr. Kazuo KOBAYASHI

Number: 155-02-83318-3

We certify that the above-mentioned mail was delivered on October 19, 2005.

570-8799

Osaka Moriguchi Post Office

October 19, 2005 8-12

催 告 書

前略、当職は株式会社GMCから依頼を受けた代理人として、貴殿に対し、平成17年9月12日付け内容証明郵便及び平成17年10月11日付け内容証明郵便により催告をいたしましたが、今日まで米国手続用宣誓書等必要書類をご返送いただけませんので、再度下記の通り催告します。

記

1. 貴殿と栗本有康が発明者として記載され、2002年9月30日に出願された特許協力条約に基づく国際出願PCT/JP2002/010220（以下「本件国際出願」と言う。）は、2005年2月17日に米国への移行手続が行われております。
2. その移行手続の一環として、貴殿には、宣誓書及び委任状並びに譲渡証（以下「米国手続用宣誓書等」と言う。）に署名することが求められております。
3. 本件国際出願に発明者として記載されている以上、このことは貴殿の権利でありかつ義務でもあります。
4. つきましては、米国手続用宣誓書等、本件国際出願に係る国際公開第WO2004/018732号パンフレットの完全な写し（フロントページ、明細書、請求の範囲及び国際調査報告を含む。全9頁。）、本件国際出願の米国移行出願に係る英文明細書の完全な写し（明細書、クレーム及びアブストラクトを含む。全7頁。）及び上記米国移行出願に関し2005年2月17日に提出した自発補正書の完全な写し（全5頁）を同封いたしますので、これらの書類の内容をご確認いただき、米国手続用宣誓書等の該当箇所に貴殿自らが署名したうえで、当該署名済み書類を当職まで速やかにご返送くださるようお願い申し上げます。

平成18年4月27日

名古屋市中区三の丸一丁目14番7号

名古屋中央法律事務所

TEL 052-203-0550

FAX 052-203-0554

株式会社GMC代理人

弁護士 西 野 泰



同 後 藤 潤 一



同 小 林 明



同 北 折 大



大阪府守口市外島町2-8-106

小林 和 夫 殿

同封書類

- (1). 宣誓書及び委任状
- (2). 譲渡証
- (3). 国際公開第WO2004/018732号パンフレットの完全な写し
- (4). 本件国際出願の米国移行出願に係る英文明細書の完全な写し
- (5). 上記米国移行出願に関し2005年2月17日に提出した自発補正書の完全な写し

以上

NOTIFICATION

We represent GMC CO., LTD. As its attorneys, we notified you of the following by September 12, 2005 verified content certified mail and by October 11, 2005 verified content certified mail. However, as of today, we have not received the document from you, so we again notify you of the following.

Information

1. International application PCT/JP2002/010220 (hereafter referred to as "international application of this case"), filed on September 30, 2002 based on the Patent Cooperation Treaty, and in which you and Yuko Kurimoto are listed as inventors, entered the U.S. National Stage on February 17, 2005.
2. As part of the U.S. National Stage, you have been asked to sign a Declaration, a Power of Attorney, and an Assignment (hereafter referred to as "Declaration etc. for the U.S. National Stage").
3. As long as you are listed as one of the inventors in the international application of this case, this is your right and your duty.
4. Enclosed are a Declaration etc. for the U.S. National Stage, and complete copies of the pamphlet of the International publication No. WO2004/018732 (including the front page, specification, claim and international search report; total 9 pages) of the international application of this case, English specification of the U.S. national phase application corresponding to the international application of this case (including the description, claim and abstract; total 7 pages) and preliminary amendment filed on February 17, 2005 (total 5 pages) regarding the U.S. national phase application. Please confirm the contents of these documents, then sign the corresponding section of Declaration etc. for the U.S. National Stage, and promptly return the executed documents to us.

April 21, 2006 (Heisei 18)

Nagoya Chuo Horitsu Jimusho

1-14-7 Sannomaru Naka-ku Nagoya-shi

TEL (052) 203-0550

FAX (052) 203-0554

Attorneys for GMC CO., LTD.

Yasuo NISHINO, Attorney

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Akihiro KOBAYASHI, Attorney

Daichi KITAORI, Attorney

To Mr. Kazuo KOBAYASHI

2-8-106 Sotojima-cho Moriguchi-shi Osaka-fu

Enclosures:

- (1). Declaration and Power of Attorney
- (2). Assignment
- (3). a complete copy of the pamphlet of the International publication No. WO2004/018732
- (4). a complete copy of English specification of the U.S. national phase application
corresponding to the international application
- (5). a complete copy of preliminary amendment filed on February 17, 2005 regarding the U.S.
national phase application

Declaration and Power of Attorney For Patent Application

特許出願宣誓書及び委任状

Japanese Language Declaration

日本語宣誓書

下記の氏名の発明者として、私は以下の通り宣誓します。

As a below named inventor, I hereby declare that:

私の住所、郵便の宛先、国籍は下記の私の氏名の後に記載されたとおりです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者（下記の氏名が複数の場合）であると信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

RUST INHIBITOR

上記発明の明細書は、

- ☐ 本書に添付されています。
- ☐ __月__日に提出され、米国出願番号または特許協力条約国際出願番号を____とし、
(該当する場合) _____に訂正されました。

the specification of which

- ☐ is attached hereto.
- ☒ was filed on 30/09/2002
as United States Application Number or
PCT International Application Number
PCT/JP02/10220 and was amended on
_____ (if applicable).

私は特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義される通り、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulation, Section 1.56.

Japanese Language Declaration
(日本語宣誓書)

私は、米国法典第 35 編 119 条 (a) - (d) 項又は 365 条 (b) 項に
基き、下記の米国以外の国の少なくとも一カ国を指定している特
許協力条約 365 (a) 項に基く国際出願、又は外国での特許出願も
しくは発明者証の出願についての外国優先権をここに主張する
とともに、優先権を主張している、本出願の前に出願された特許ま
たは発明者証の外国出願を以下に、枠内をマークすることで、示
しています。

I hereby claim foreign priority under Title 35, United States Code,
Section 119 (a)-(d) or 365(b) of any foreign application (s) for
patent or inventor's certificate, or Section 365(a) of any PCT
international application which designated at least one country
other than the United States, listed below and have also
identified below, by checking the box, any foreign application for
patent or inventor's certificate, or PCT International application
having a filing date before that of the application on which
priority is claimed.

Prior Foreign Application(s)
外国での先行出願

Priority Claimed
優先権主張

2002-239045	Japan
(Number)	(Country)
(番号)	(国名)
PCT/JP02/10220	Japan
(Number)	(Country)
(番号)	(国名)
(Number)	(Country)
(番号)	(国名)

20/08/2002	<input checked="" type="checkbox"/> <input type="checkbox"/>
(Day/Month/Year Filed)	Yes No
(出願年月日)	はい いいえ
30/09/2002	<input checked="" type="checkbox"/> <input type="checkbox"/>
(Day/Month/Year Filed)	Yes No
(出願年月日)	はい いいえ
(Day/Month/Year Filed)	<input type="checkbox"/> <input type="checkbox"/>
(出願年月日)	Yes No
	はい いいえ

私は、下記の米国法典第 35 編 120 条に基づいて下記の米国特
許出願に記載された権利、又は米国を指定している特許協力条
約 365 条に基づく権利をここに主張します。また、本出願の各請
求範囲の内容が米国法典第 35 編 112 条第 1 項又は特許協力条約
で規定された方法で先行する米国特許出願に開示されていない
限り、その先行米国出願書提出日以降で本出願書の日本国内ま
たは特許協力条約国際提出日までの期間中に入手された、連邦
規則法典第 37 編 1 条 56 項で定義された特許資格の有無に関す
る重要な情報について開示義務があることを認識しています。

I hereby claim the benefit under Title 35, United States
Code, Section 120 of any United States (s), or Section 365(c) of
any PCT International application designating the United States,
listed below and, insofar as the subject matter of each of the
claims of this application is not disclosed in the prior United
States or PCT International application in the manner provided by
the first paragraph of Title 35, United States code Section 112, I
acknowledge the duty to disclose information which is material to
patentability as defined in Title 37, Code of Federal Regulations,
Section 1.56 which became available between the filing date of the
prior application and the national or PCT International filing date
of application.

(Application No.)
(出願番号)

(Filing Date)
(出願日)

(Status: Patented, Pending, Abandoned)
(現況：特許許可済、係属中、放棄済)

(Application No.)
(出願番号)

(Filing Date)
(出願日)

(Status: Patented, Pending, Abandoned)
(現況：特許許可済、係属中、放棄済)

私は、私自身の知識に基づいて、本宣誓書中で私が行う表明が
真実であり、かつ私の入手した情報と私の信じることに基
づく表明が全て真実であると信じていること、さらに故意になさ
れた虚偽の表明及びそれと同等の行為は米国法典第 18 編第
1001 条に基づき、罰金または拘禁、もしくはその両方によ
り処罰されること、そしてそのような虚偽の声明を行えば、出
願した、又は既に許可された特許の有効性が失われることを認
識し、よってここに上記のごとく宣誓をいたします。

I hereby declare that all statements made herein of my own
knowledge are true and that all statements made on information
and belief are believed to be true; and further that these
statements were made with the knowledge that willful false
statements and the like so made are punishable by fine or
imprisonment, or both, under Section 1001 of Title 18 of the
United States Code and that such willful false statements may
jeopardize the validity of the application or any patent issued
thereon.

Japanese Language Declaration
(日本語宣誓書)

委任状：私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。
(弁理士、または代理人の氏名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)

James A. Oliff, Reg. No 27075

書類送付先

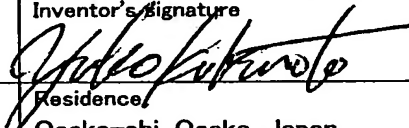
Send Correspondence to:

Oliff & Berridge, PLC
277 South Washington Street, Suite 500
Alexandria, Virginia 22314

直接電話連絡先：(名前及び電話番号)

Direct Telephone Calls to: (name and telephone number)

(703) 836-6400

唯一または第一発明者名	Full name of sole or first inventor Yuko KURIMOTO
発明者の署名	Inventor's signature 
日付	Date March 30 2005
住所	Residence Osaka-shi, Osaka, Japan
国籍	Citizenship Japan
郵便の宛先	Post Office Address 10-11-110, Higashimikuni 2-chome, Yodogawa-ku, Osaka-shi, Osaka 532-0002 Japan

第二共同発明者名	Full name of second joint inventor, if any Kazuo KOBAYASHI
第二共同発明者の署名	Second Inventor's signature
日付	Date
住所	Residence Moriguchi-shi, Osaka, Japan
国籍	Citizenship Japan
郵便の宛先	Post Office Address 2-8-106, Sotojima-cho, Moriguchi-shi, Osaka 570-0096 Japan

(第三以降の共同発明者についても同様に記載し、署名すること)

(Supply similar information and signature for third and subsequent joint inventors.)

ASSIGNMENT FOR US PATENT APPLICATION

WHEREAS, the undersigned inventors, Yuko KURIMOTO of 10-11-110, Higashimikuni 2-chome, Yodogawa-ku, Osaka-shi, Osaka 532-0002 Japan, and Kazuo KOBAYASHI of 2-8-106, Sotojima-cho, Moriguchi-shi, Osaka 570-0096 Japan (hereinafter referred to as "the Assignors"), have invented certain new and useful improvements in "RUST INHIBITOR", for which an International patent application was filed on September 30, 2002 and was assigned serial number PCT/JP02/010220; and


WHEREAS, Primet Technology Inc., a corporation duly organized under and pursuant to the laws of Japan, and having a principal place of business at 8-11, Nishi-Shinbashi 1-chome, Minato-ku, Tokyo 105-0003 Japan (hereinafter referred to as "the Assignee"), is desirous of acquiring the entire right, title and interest of the Assignors in and to said improvements, the entire right, title and interest of the Assignors in and to any US patent application(s) based on said improvements, and in and to any Patent(s) of the United States, to be obtained therefor and thereon;

NOW, THEREFORE, for good and valuable consideration, the receipt of which is hereby acknowledged, the Assignors have sold, assigned, transferred, and set over, do hereby sell, assign, transfer, and set over, unto the Assignee, its successors, legal representatives, and assign, the entire right, title, and interest of the Assignors in and to the above-mentioned improvements, the entire right, title and interest of the Assignors in and to any US patent applications and any and all Patents of the United States of America that may be granted therefor and thereon, and in and to any and all applications claiming priority to said applications, divisions, continuations, and continuations-in-part of said applications, and reissues and extensions of said Patents, and all rights under the International Convention for the Protection of Industrial Property, the same to be held and enjoyed by the Assignee, for their own use and behalf and the use and behalf of its successors, legal representatives, and assigns, to the full end of the term or terms for which Patents may be granted as fully and entirely as the same would have been held and enjoyed by the Assignors had this sale and assignment not been made;

AND for the same consideration, the Assignors hereby covenant to and agree with the Assignee, their successors, legal representatives, and assign, that, at the time of execution and delivery of these presents, the Assignors are the sole and lawful owners of the entire right, title, and interest in and to the improvements set forth in said above-mentioned application, and that the same right, title, and interest are unencumbered, and that the Assignors have good and full right and lawful authority to sell and convey the same in the manner herein set forth;

AND for the same consideration, the Assignors hereby covenant to and agree with the Assignee, its successors, legal representatives, and assign that the Assignors will, whenever counsel of the Assignee, or the counsel of its successors, legal representatives, and assign, shall advise that any proceeding in connection with said improvements or said applications for Patents, or any proceeding in connection with Patents for said improvements in the United States of America, including interference proceedings, are lawful and desirable, or that any application claiming priority to said application, division, continuation, or continuation-in-part of any applications for Patents, or any reissue or extension of any Patents to be obtained thereon, are lawful and desirable, sign all papers and documents, take all lawful oaths, and do all acts necessary or required to be done for the procurement, maintenance, enforcement, and defense of Patents for said improvements, without charge to the Assignee, their successors, legal representatives, and assigns, but at the cost and expense of the Assignee, its successors, legal representatives, and assigns;

AND the Assignors hereby request the Commissioner of Patents and Trademarks to issue any and all said Patent(s) of the United States to the Assignee as the Assignee of said improvements, the Patent(s) to be issued for the sole use and behalf of the Assignee, its successors, legal representatives, and assigns.

Date: March 5 2005 Name of Assignor 
Yuko KURIMOTO

Date: _____ Name of Assignor _____
Kazuo KOBAYASHI

(19) 世界知的所有権機関
国際事務局(43) 国際公開日
2004年3月4日 (04.03.2004)

PCT

(10) 国際公開番号
WO 2004/018732 A1

- (51) 国際特許分類: C23F 11/00 (74) 代理人: 中井 信宏 (NAKAI, Nobuhiro); 〒540-0031 大阪府大阪市中央区北浜東2-16 日刊工業新聞社大阪支社ビル7階 Osaka (JP).
- (21) 国際出願番号: PCT/JP2002/010220
- (22) 国際出願日: 2002年9月30日 (30.09.2002) (81) 指定国 (国内): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (25) 国際出願の言語: 日本語
- (26) 国際公開の言語: 日本語
- (30) 優先権データ: 特願2002-239045 2002年8月20日 (20.08.2002) JP
- (71) 出願人 (米国を除く全ての指定国について): 有限会社ジーエムシー (GMC CO., LTD.) [JP/JP]; 〒540-0031 大阪府大阪市中央区北浜東2-16 日刊工業新聞社大阪支社ビル7階 Osaka (JP).
- (71) 出願人 および (84) 指定国 (広域): ARIPO 特許 (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), ユーラシア特許 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), ヨーロッパ特許 (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI 特許 (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (72) 発明者: 栗本 有康 (KURIMOTO, Yuko) [JP/JP]; 〒532-0002 大阪府大阪市淀川区東三国2丁目10番11-110号 Osaka (JP).
- 添付公開書類:
— 国際調査報告書
- (72) 発明者; および (2文字コード及び他の略語については、定期発行される各PCTガゼットの巻頭に掲載されている「コードと略語のガイダンスノート」を参照。
- (75) 発明者/出願人 (米国についてのみ): 小林 和夫 (KOBAYASHI, Kazuo) [JP/JP]; 〒570-0096 大阪府守口市外島町2-8-106 Osaka (JP).

WO 2004/018732 A1

(54) Title: ANTICORROSIVE

(54) 発明の名称: 防錆剤

(57) Abstract: An anticorrosive which combines the same easiness as coating with the same superior properties as metal spraying. Flaky particles of zinc and aluminum produced with a stamping mill are introduced as fine inorganic metal particles into a modified silicone resin solution to produce the anticorrosive. A silane type silicone resin is used for the modified silicone resin solution. For example, a solution comprising a mixture of an organosilane type silicone resin and an oligomeric silane coupling agent or the like is used.

(57) 要約: 塗装方法と同様の簡便さと金属溶射方法と同等の優位特性を発揮することができる防錆剤である。スタンピングミルで製造することによって鱗箔状に形成された無機微粉金属としての亜鉛及びアルミニウムを変性シリコーン樹脂溶液に混入調製して製造する。変性シリコーン樹脂溶液には、シラン系のシリコーン樹脂を使用し、例えばオルガノシラン系シリコーン樹脂にオリゴマー型シランカップリング剤等の混入溶液を用いる。

明 細 書

防錆剤

技術分野

- 5 この発明は、防錆剤に関し、特に塗装方法と同様の簡便さと金属溶射方法と同様の優位特性を発揮することができるようにしたものに関する。

背景技術

- 10 従来、鉄鋼材の防食（防錆）方法には、塗料や他の有機材料による表面被覆によって酸素、硫化物、ハロゲン化物等との接触を遮断する塗装方法、熔融亜鉛に被処理物を一定時間浸漬させ亜鉛を付着形成させる亜鉛鍍金方法、亜鉛・アルミニウムを溶かして鉄鋼構造物表面に複合皮膜として付着させ犠牲陽極反応を利用することにより、この形成被膜の厚さに応じて経年酸化を抑制し耐久性を向上するようにした金属溶射方法等がある。

- 15 上記した従来から実施されている防食方法には、下記のような各種問題点があった。すなわち、塗装方法では、有機溶剤塗装であるため、硬度が不足し、表面の損傷や損耗による傷が原因となって空気と金属表面との遮断機能が劣化し、風化や紫外線劣化、外損傷等による腐食が発生するという問題点があった。

- 20 亜鉛鍍金方法では、10年程度の耐食性能があるものの、実施のためには浸漬のための大型プラントが必要であり、既設鉄鋼構造物のメンテナンスには適応できないという問題点があった。また、薄板鋼板や長尺鋼材には熔融温度と浸漬ブールの問題からも適用できなかった。最近では亜鉛アルミニウムの合金鍍金の技術確立も進んできているが、結局セラミック炉等の設備にコストがかかり、経済的な面からも問題があるとともに、亜鉛・アルミニウムの合金鍍金では、亜鉛と
25 アルミニウムの冷却速度の違いにより、アルミニウムの結晶粒の大きさが異なる

ため、いわゆる粒界面の腐食等が生じやすいという特性上の問題があった。

さらに、金属溶射方法では、犠牲陽極反応により内部の金属を保護するため、亜鉛鍍金以上の耐性を発揮するものの、金属溶射のための機械装置（溶射ガン、電源装置、送風装置、線材巻取り送出し装置、溶射延長コード等）が必要であり、施工効率は職人の技術による決定要素もあって、1日の施工面積が30m²程度で、装置の搬入・整備の負担が大きいことからみても、採算面での検討を必要とし、既設構造物への溶射や狭隘な構造部分への施工には困難性があるといった問題点があった。また、亜鉛・アルミニウムを溶かして被処理物の表面に強制的に付着させるためには、鉄鋼構造物表面にショットブラストを施したり、粗面形成剤を用いてアンカー効果を発揮させるといった前処理が必要であった。

そこで、本発明は、従来の防食方法の利点を活かしつつ、上記した問題点を解消することができる防錆剤、すなわち、塗装方法と同様の簡便さと金属溶射方法と同等の優位特性を発揮することができる防錆剤の提供を課題とする。

発明の開示

本発明は上記課題を解決するため、次のような構成を採用した。すなわち、本発明にかかる防錆剤は、鱗箔状に形成された亜鉛及びアルミニウムを変性シリコーン樹脂溶液に混入調製してなることを特徴としている。

このように、変性シリコーン樹脂溶液に鱗箔状に形成された亜鉛及びアルミニウムを混入させ防錆剤として調製すると、変性シリコーン樹脂溶液の有する反応性の異なる2種類の官能基のうちの1つが鱗箔状の亜鉛とアルミニウムに対してそれぞれの水酸基分子同士が加水分解されて化学結合し、部分的に縮合して鱗箔状の亜鉛とアルミニウムがバイнда状に混入した状態（Al-O-Si-OR等の化学結合状態）となる。この状態で鉄鋼構造物の表面に塗布すると、変性シリコーン樹脂溶液の他の官能基が鉄鋼構造物表面のFe水酸基と結合し加水分解さ

れ、水素結合的に吸着し、その後乾燥していくと脱水縮合反応により強固に化学結合 ($\text{Fe}-\text{O}-\text{Si}-\text{OR}$) する。かかる作用により、鉄鋼構造物表面に鱗箔状の亜鉛・アルミニウムのバインダ層が結果的に異種金属結合した状態で形成される。

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発明を実施するための最良の形態

以下、本発明の好ましい実施の形態について説明する。本発明にかかる防錆剤は、鱗箔状に形成された無機微粉金属としての亜鉛及びアルミニウムを変性シリコーン樹脂溶液に混入調製して製造される。これら鱗箔状に形成される亜鉛及びアルミニウムの大きさは、150～300メッシュが好ましいが、亜鉛及びアルミニウムともに180メッシュのものが本防錆剤中に年輪状に交互に積層されることになるのでより好ましい。亜鉛とアルミニウムの微粉末は、アトマーズ法や電界法ならず、スタンピングミルで製造することによって鱗箔状に形成しており、より金属結晶が微細化されている。これらが年輪状に交互に積層されることによって、アルミニウムの標準単極電位が -1.662 V 、亜鉛の標準単極電位 -0.762 V 、鉄の標準単極電位が -0.447 V であるから、これら相互間に電位差が発生し、犠牲陽極効果による防錆効果に最適となる。

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また、鱗箔状に形成された亜鉛及びアルミニウムを変性シリコーン樹脂溶液に混入する際には、鱗箔状の亜鉛及びアルミニウムに付着している他の物質、例えば、ステアリン酸等の物質を除去精製しておく必要がある。かかる処置は、無機溶液混入時に過剰化学反応を抑えるためである。

本防錆剤の変性シリコーン樹脂溶液には、シラン系のシリコーン樹脂が使用されており、例えばオルガノシラン系シリコーン樹脂にオリゴマー型シランカップリング剤等の混入溶液が適している。

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具体的には、硬化触媒を含有する脱メタノール硬化型メチル系シリコーン樹脂

溶液（3官能性を持つオルガノシルセスキオキサンを基本骨格とするシリコーン樹脂を基本構成とする）のオルガノシランや、反応基アルコキシ基（ $\text{Si}-\text{OR}$ ）のメトキシ基を含有するアルコキシオリゴマーをそれぞれ単独で使用したり、両樹脂を同時に使用するほか、これらの樹脂にアルミニウムアルコキシド $\text{Al}(\text{OR})_3$ を混ぜたり、さらにアルコール類を混合する等の色々な組み合わせ混合溶液で構成されている。更に、各溶液と微粉金属の化学反応及び塗装性を考慮し、溶液の粘度は 25°C において $22 \sim 25 \text{ mm}^2/\text{S}$ が最適であり、かかる粘度調整により塗料化しやすくなる。

このように、変性シリコーン樹脂溶液に鱗箔状に形成された亜鉛及びアルミニウムを混入させ防錆剤として調製すると、変性シリコーン樹脂溶液の有する反応性の異なる2種類の官能基のうちの1つが鱗箔状の亜鉛とアルミニウムに対してそれぞれの水酸基分子同士が加水分解されて化学結合し、部分的に縮合して鱗箔状の亜鉛とアルミニウムがバイнда状に混入した状態（ $\text{Al}-\text{O}-\text{Si}-\text{OR}$ 等の化学結合状態）となる。

この状態で鉄鋼構造物の表面に塗布すると、変性シリコーン樹脂溶液の他の官能基が鉄鋼構造物表面の Fe 水酸基と結合し加水分解され、水素結合的に吸着し、その後乾燥していくと脱水縮合反応により強固に化学結合（ $\text{Fe}-\text{O}-\text{Si}-\text{OR}$ ）する。かかる作用により、鉄鋼構造物表面に鱗箔状の亜鉛・アルミニウムのバイнда層が結果的に異種金属結合した状態で形成され、いわゆる鉄表面に亜鉛・アルミニウムがアルコキシオリゴマーの架橋反応により3次元的に交互に積層した状態に架橋されることになり、通電性を発揮して犠牲陽極機能も発揮することになる。また、亜鉛とアルミニウムの微粉末は鱗箔状に形成されているので、より微細化された亜鉛とアルミニウムとが単一金属で交互に積層した状態で結合すると、粒界面における腐食等も生じなくなる。

本発明にかかる防錆剤は、上記したように構成されるので、鉄鋼構造物の表面

に対して塗料のように塗布することができるとともに、通電性のある無機硬質な化学結合を鉄鋼構造物表面で起こすため、金属溶射方法による表面処理と同様の防錆機能を発揮することができる。また、塗料と同様の作業性により金属溶射の際に必要な機械装置等が不要になり、既設構造物や狭隘な構造部分への施工についても容易に行うことができる。また、装置類が不要なほか、亜鉛・アルミニウムを溶かして被処理物の表面に強制的に付着させるためのショットブラストや粗面形成剤を用いてアンカー効果を発揮させるといった前処理も不要であり、コスト的にも優れたものになる。

10 産業上の利用可能性

上記説明から明らかなように、本発明による防錆剤は、塗装方法と同様の簡便さで金属溶射方法と同等の犠牲陽極特性を発揮することができるとともに、亜鉛・アルミニウムを溶かして被処理物の表面に物理的に強制的に付着させるものではなく、化学結合によって異種金属を単一金属のまま結合させるため、外部からの応力によって生じる歪みなどで剥離することもなくその耐性を大幅に向上することもできる。

請 求 の 範 囲

1. 鱗箔状に形成された亜鉛及びアルミニウムを変性シリコーン樹脂溶液に混入調製してなることを特徴とする防錆剤。

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP02/10220

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ C23F11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl⁷ C23F11/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1926-1996	Toroku Jitsuyo Shinan Koho	1994-2002
Kokai Jitsuyo Shinan Koho	1971-2002	Jitsuyo Shinan Toroku Koho	1996-2002

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2002-35686 A (Dai Nippon Toryo Co., Ltd.), 05 February, 2002 (05.02.02), (Family: none)	1
A	JP 2001-124303 A (Shikoku Electric Power Co., Inc.), 11 May, 2001 (11.05.01), (Family: none)	1

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:
 "A" document defining the general state of the art which is not considered to be of particular relevance
 "E" earlier document but published on or after the international filing date
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
 "O" document referring to an oral disclosure, use, exhibition or other means
 "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
 "&" document member of the same patent family

Date of the actual completion of the international search
24 March, 2003 (24.03.03)

Date of mailing of the international search report
08 April, 2003 (08.04.03)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

A. 発明の属する分野の分類 (国際特許分類 (IPC))

Int. Cl. G23F 11/00

B. 調査を行った分野

調査を行った最小限資料 (国際特許分類 (IPC))

Int. Cl. C23F 11/00

最小限資料以外の資料で調査を行った分野に含まれるもの

日本国実用新案公報 1926-1996年

日本国公開実用新案公報 1971-2002年

日本国登録実用新案公報 1994-2002年

日本国実用新案登録公報 1996-2002年

国際調査で使用した電子データベース (データベースの名称、調査に使用した用語)

C. 関連すると認められる文献

引用文献の カテゴリー*	引用文献名 及び一部の箇所が関連するときは、その関連する箇所の表示	関連する 請求の範囲の番号
A	JP 2002-35686 A (大日本塗料株式会社) 2002.02.05 (ファミリーなし)	1
A	JP 2001-124303 A (四国電力株式会社) 2001.05.11 (ファミリーなし)	1

☐ C欄の続きにも文献が列挙されている。☐ パテントファミリーに関する別紙を参照。

* 引用文献のカテゴリー

「A」 特に関連のある文献ではなく、一般的技術水準を示すもの

「E」 国際出願日前の出願または特許であるが、国際出願日以後に公表されたもの

「L」 優先権主張に疑義を提起する文献又は他の文献の発行日若しくは他の特別な理由を確立するために引用する文献 (理由を付す)

「O」 口頭による開示、使用、展示等に関する文献

「P」 国際出願日前で、かつ優先権の主張の基礎となる出願

の日の後に公表された文献

「T」 国際出願日又は優先日後に公表された文献であって出願と矛盾するものではなく、発明の原理又は理論の理解のために引用するもの

「X」 特に関連のある文献であって、当該文献のみで発明の新規性又は進歩性がないと考えられるもの

「Y」 特に関連のある文献であって、当該文献と他の1以上の文献との、当業者にとって自明である組合せによって進歩性がないと考えられるもの

「&」 同一パテントファミリー文献

国際調査を完了した日

24.03.03

国際調査報告の発送日

国際調査機関の名称及びあて先

日本国特許庁 (ISA/JP)

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特許庁審査官 (権限のある職員)

鈴木正紀

電話番号 03-3581-1101 内線 3424

08.04.03

4E 8520

DESCRIPTION

RUST INHIBITOR

TECHNICAL FIELD

The present invention relates to a rust inhibitor, more particularly to a rust inhibitor which ensures the simplicity of application typical for a coating process and can demonstrate excellent characteristics similar to those obtained with a metal spraying method.

BACKGROUND ART

Conventional methods for inhibiting corrosion (rust formation) of iron and steel materials include a coating method in which contact with oxygen, sulfides, halides, and the like is prevented by a surface coating composed of a paint or other organic materials, a zinc plating method in which the processing object is dipped for a certain time into molten zinc and the zinc is caused to adhere thereto, and a metal spraying method in which zinc and aluminum are melted and caused to adhere as a composite film to the surface of an iron or steel structure and the oxidation with time is suppressed and endurance is improved correspondingly to the thickness of the formed coating by using the sacrificial anode reaction.

The following problems were associated with the above-described corrosion protection methods that have been conventionally implemented. Thus, in the coating method, because the organic solvent coating was used, hardness was insufficient, the function of shielding the metal surface from air was degraded due to surface damage or wear-induced defects, and corrosion occurred as a result of weathering, UV degradation, outer damage and the like.

With the zinc plating method, corrosion protection performance could be demonstrated for about 10 years, but a large plant suitable for dipping was required to implement the method and the method could not be adapted to maintain the existing iron and steel structures. Furthermore, it could not be employed with thin steel sheets and long steel materials due to problems associated with melting temperature and dipping pool. In recent years, the establishment of technology for zinc-aluminum alloy plating has been advanced, but the cost

of equipment such as ceramic furnaces was high and cost efficiency of the process created a problem. Moreover, in the zinc-aluminum alloy plating, the size of aluminum crystal grains differed due to a difference in the cooling rate of zinc and aluminum. The resultant problem associated with characteristics was that the so-called grain boundary corrosion could easily occur.

The metal spraying method demonstrated a level of protection higher than that attained with zinc plating because the metal of internal zones was protected by a sacrificial anode reaction. However, mechanical equipment for metal spraying (spraying gun, power source unit, air blowing unit, wire coiling-uncoiling unit, spray extension cord, and the like) was required. Furthermore, the process efficiency was also dependent on the technological skills of the operator, and at a daily processing surface area of about 30 m², transportation and preparation of equipment placed a large load on the operator, thereby creating the necessity to examine the profitability of the process. Yet another problem was that spraying on the already installed structures and processing of narrow structural components were difficult. Moreover, in order to cause forcible adhesion of molten zinc and aluminum to the surface of the processing object, the surface of iron and steel structures had to be pretreated by shot blasting or with a surface roughening agent so that the anchor effect be demonstrated.

Accordingly, it is an object of present invention to provide a rust inhibitor which is capable of resolving the above-described problems, while realizing the advantages of the conventional methods for corrosion protection, that is, a rust inhibitor which ensures the simplicity of application typical for a coating process and can demonstrate excellent characteristics similar to those obtained with a metal spraying method.

DISCLOSURE OF THE INVENTION

In order to resolve the aforementioned problems, the present invention employs the following feature. Thus, the rust inhibitor in accordance with the present invention is prepared by mixing zinc and aluminum formed to have a flaky shape with a modified silicone resin solution.

If a rust inhibitor is thus prepared by mixing zinc and aluminum formed to have a flaky shape with a modified silicone resin solution, one of the functional groups of two types with different reactivity that are had by the modified silicone resin solution is chemically bonded to the flaky zinc and aluminum by mutual hydrolysis of respective hydroxyl groups thereof and partially condensed, producing a state (chemical bonding state such as Al-O-Si-OR) in which flaky zinc and aluminum are admixed in the form of a binder. If the rust inhibitor is coated in this state on the surface of iron or steel structure, then the other functional group of the modified silicone resin solution is bonded to the Fe hydroxyl group of the surface of iron or steel structure, hydrolyzed, and adsorbed via a hydrogen bonding mechanism. Subsequent drying produces strong chemical bonds (Fe-O-Si-OR) by a dehydrocondensation reaction. As a result of such an action, a flaky zinc-aluminum binder layer is finally formed on the surface of the iron or steel structure in a state in which dissimilar metals are bonded to each other.

BEST MODE FOR CARRYING OUT THE INVENTION

The preferred embodiment of the present invention will be described below. The rust inhibitor in accordance with the present invention is manufactured by admixing zinc and aluminum as fine powders of inorganic metals formed to have a flaky shape to a modified silicone resin solution. The size of those zinc and aluminum formed to have a flaky shape is preferably 150-300 mesh, but it is more preferred that both zinc and aluminum have a size of 180 mesh which would be stacked alternately in the form of annual rings in the present rust inhibitor. The fine powders of zinc and aluminum are manufactured with a stamping mill, without employing an atomization method or electrolytic method, and formed to have a flaky shape, such a process producing more refined crystal grains of the metal. Stacking the fine powders alternately in the form of annual rings produces an optimum rust inhibitor effect based on a sacrificial anode effect. This is because the standard single electrode potential of aluminum is -1.662 V, standard single electrode potential of zinc is -0.762 V, and standard single electrode potential of iron is -0.447 V, and a difference in potential is generated therebetween.

Further, when the zinc and aluminum formed to have a flaky shape are mixed with a modified silicone resin solution, it is necessary to conduct purification by removing other substances that adhered to the flaky zinc and aluminum, for example, stearic acid. This treatment is conducted to suppress excess chemical reactions when an inorganic solution is admixed.

A silane-type silicone resin is used for the modified silicone resin solution of the present rust inhibitor; for example, a mixed solution of an organosilane-type silicone resin and an oligomer-type silane coupling agent and the like is suitable.

More specifically, an organosilane of a demethanolization-curable methyl-type silicone resin solution comprising a curing catalyst (a silicone resin comprising organosilsesquioxane based skeleton having three functional groups as a base configuration) or an alkoxy oligomer having a methoxy group of reactive alkoxy silyl groups (Si-OR) are used individually or both resins are used together. Alternatively, an aluminum alkoxide Al(OR)_3 is mixed with those resins and an alcohol is further admixed to obtain the mixed solutions of various compositions. Further, the viscosity of solution of 22-25 mm^2/S at a temperature of 25°C is optimum from the standpoint of chemical reactions and coatability of the solutions and finely powdered metals, and obtaining such a viscosity facilitates the preparation of a coating material.

If a rust inhibitor is thus prepared by mixing zinc and aluminum formed to have a flaky shape with a modified silicone resin solution, one of the functional groups of two types with different reactivity that are had by the modified silicone resin solution is chemically bonded to the flaky zinc and aluminum by mutual hydrolysis of respective hydroxyl groups thereof and partially condensed, producing a state (chemical bonding state such as Al-O-Si-OR) in which flaky zinc and aluminum are admixed in the form of a binder.

If the rust inhibitor is coated in this state on the surface of iron or steel structure, then the other functional group of the modified silicone resin solution is bonded to the Fe hydroxyl group of the surface of iron or steel structure, hydrolyzed, and adsorbed via a hydrogen bonding mechanism. Subsequent drying produces strong chemical bonds (Fe-O-Si-OR) by dehydrocondensation reaction. As a result of such an action, a flaky zinc-aluminum binder layer is finally formed on the surface of the iron or steel structure in a state in which dissimilar

metals are bonded to each other, and this layer is crosslinked to the iron surface in a state in which so-called zinc and aluminum are stacked three-dimensionally and alternately due to an alkoxy oligomer crosslinking reaction, electric conductivity is demonstrated and sacrificial anode function is also demonstrated. Furthermore, because fine powders of zinc and aluminum are formed to have a flaky shape, corrosion on grain boundaries or the like is also prevented if the more refined zinc and aluminum are bonded in a state in which individual metals are stacked alternately.

Because the rust inhibitor in accordance with the present invention has the above-described configuration it can be coated as a paint on the surface of iron and steel structures. Further, because electrically conductive inorganic hard chemical bonds are induced on the surface of iron and steel structures, a rust inhibiting performance identical to that of the surface treatment by a metal spraying method can be demonstrated. Furthermore, because of operability similar to that of paints, mechanical equipment or the like that is required during metal spraying becomes unnecessary and processing can be easily conducted to already installed structures and narrow structural components. Moreover, not only the equipment is unnecessary, but also a pretreatment such as shot blasting serving to melt zinc and aluminum to cause forcible adhesion to the surface of the processing object or by using a surface roughening agent to demonstrate an anchor effect become unnecessary and cost can be reduced.

INDUSTRIAL APPLICABILITY

As clearly described hereinabove, the rust inhibitor in accordance with the present invention ensures the simplicity of application typical for a coating process and can demonstrate sacrificial anode characteristics similar to those obtained with a metal spraying method. Moreover, because dissimilar metals are bonded as individual metals with chemical bonds, rather than by melting zinc and aluminum and forcing to adhere physically to the surface of the processing object, peeling caused, e.g., by strains induced by external stresses is prevented and the endurance can be greatly increased.

CLAIMS

1. A rust inhibitor prepared by admixing zinc and aluminum formed to have a flaky shape to a modified silicone resin solution.

ABSTRACT

A rust inhibitor which ensures the simplicity of application typical for a coating process and can demonstrate excellent characteristics similar to those obtained with a metal spraying method. The rust inhibitor is manufactured by admixing zinc and aluminum as fine powders of inorganic metals, which are manufactured with a stamping mill to have a flaky shape, to a modified silicone resin solution. A silane-type silicone resin is used for the modified silicone resin solution. For example, a mixed solution of an organosilane-type silicone resin and an oligomer-type silane coupling agent and the like is used.

PATENT APPLICATION**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of

Yuko KURIMOTO et al.

Application No.: New U.S. National Stage of
PCT/JP02/10220

Filed: February 17, 2005

Docket No.: 122778

For: RUST INHIBITOR

PRELIMINARY AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Please consider the following:

Amendments to the Specification;

Amendments to the Claims as reflected in the listing of claims; and

Remarks.

10. (New) A rust inhibitor according to claim 1, wherein the modified silicone resin solution comprises an aluminum alkoxide (Al(OR)_3).
11. (New) A rust inhibitor according to claim 10, wherein the modified silicone resin solution further comprises at least one alcohol.
12. (New) A rust inhibitor according to claim 1, wherein the viscosity of the modified silicone resin solution is 22-25 mm^2/S at a temperature of 25°C.
13. (New) A method of inhibiting the formation of rust comprising:
 - preparing zinc and aluminum formed to have a flaky shape;
 - preparing a rust inhibitor by mixing the zinc and aluminum formed to have a flaky shape to a modified silicone resin solution;
 - coating an iron or steel structure with the rust inhibitor; and
 - drying the coated rust inhibitor.

REMARKS

Claims 1-13 are pending in this application. By this amendment, claim 2-13 are added.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
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JAO:JSA/mps

Date: February 17, 2005

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